C.B. 5 WATT SOLID STATE TRANSCEIVER

TRC-9A

OWNER'S MANUAL

PLEASE READ BEFORE USING THIS EQUIPMENT

REALISTIC®

MP MASTER
MA32776

CAT. NO. 21-139

CUSTOM MANUFACTURED FOR RADIO SHACK A DIVISION OF TANDY CORPORATION

Your **REALISTIC TRC-9A** is a compact 5 watt CB Transceiver designed for mobile 3 channel 2-way operation. The circuitry is all solid-state, mounted on a rugged printed circuit board. It is skillfully constructed to provide the reliable trouble-free performance you expect.

This Transceiver comes complete with a set of Channel 9 crystals already installed. However, it may be operated on any 2 channels of the other 22 available by purchasing and installing additional crystals—one for Transmit and one for Receive for each of the desired channels (see Crystal Installation).

Channel 9 has been set aside by the Federal Communications Commission as the emergency channel. Should an emergency arise while using your vehicle (at night, on vacation, a major breakdown on an interstate highway or on some lonely stretch of highway), you can use your TRC-9A and call for help. Chances are good you will receive immediate response and help will be on the way in minutes, because thousands of highway service vehicles, local and state police, service stations and CBers are monitoring Channel 9.

FEATURES

* Variable SQUELCH Control, to eliminate background noise.
* Automatic Noise Limiting Circuit (built-in), to reduce or eliminate impulse or static type noises.
* Automatic Gain Control (built-in), to provide constant sound level.
* Push-Pull Audio Amplifier, to provide the highest quality of sound reproduction.
* Modulation Indicator, lets you know when you are transmitting.
* External SPK jack, allows you to use an external speaker (8 ohms).

The TRC-9A is intended for use in Class D Citizens Radio Service under the conditions prescribed in Part 95 of the FCC Rules and Regulations. In order to legally operate this transceiver, you must file Application Form 505 with the Federal Communications Commission.

Your Transceiver has been built in accordance with Radio Shack's exacting quality control standards. However, it should be treated with reasonable care accorded any electronic equipment. Avoid exposing this unit to severe shock, dirt or moisture conditions.

RADIO SHACK LIMITED WARRANTY

This equipment is warranteed against defects for 90 days from date of purchase. Within this period, we will repair it without charge for parts and labor. Simply **bring your sales slip** as proof of purchase date to any Radio Shack store. Warranty does not cover transportation costs. Nor does it cover equipment subjected to misuse or accidental damage.

This Warranty gives you specific legal rights and you may also have other rights which vary from state to state.

We Service What We Sell

SPECIFICATIONS

TRANSMITTER

Power Input	5 watts
Power Output	2.6 watts
Modulation	85%
Emission Type	8A3
Frequency Tolerance	0.005%
Antenna Impedance	50 ohms (SO-239 receptacle)

RECEIVER

Sensitivity	0.7 μV for 10 dB (S+N)/N
Selectivity	6 kHz @-6 dB
Adjacent Channel Rejection	36 dB
Audio Distortion at 1000 Hz	0.8 W 10%
Signal-to-noise Ratio	40 dB
I.F. Frequency	455 kHz
Squelch	Adjustable from 50 μV to 3,000 μV

GENERAL

Channels	Any 3 in CB band. Supplied with channel 9 crystals ("A" position)
Frequency Coverage	26.965 to 27.255 MHz with appropriate crystals
Power Requirements	12.5–15 volts DC, **negative ground only.**
Current Drain	RX .3A (full volume), TX 1.2A (with modulation)
Built-in Speaker	Dynamic (8 ohms)
Microphone	Dynamic with push-to-talk switch and coiled cable
Semiconductors	14 transistors, 9 diodes, and 2 thermistors

F.C.C. LICENSE (U.S.A.)

Before transmitting with your TRC-9A, you must obtain an FCC Class D Citizens Radio Service License. You can obtain a license application Form 505 from the Federal Communications Commission; Washington, D.C. 20554 or from the nearest FCC field office. Complete the form and mail with appropriate fee to:

Federal Communications Commission
Gettysburg, Penn. 17325

You must also read and know Part 95 of the FCC Rules and Regulations; they apply to the operation of a Class D Citizens Band unit. Copies of this regulation are available from the FCC office.

USING YOUR TRANSCEIVER

Do NOT Transmit without a suitable antenna or load connected to the **ANT**enna connector. For Installation, refer to that section.

TO RECEIVE

1. Set **SQUELCH** control maximum counterclockwise.
2. Turn power "on" by rotating **VOLUME** clockwise.
3. Set **Channel Selector** to the desired channel.
4. Adjust **SQUELCH** to cut out annoying background noise when no signal is being received. To do this, set Channel Selector to "A" and wait till signals cease. (Or, if you have installed additional crystals, you can select one of those channels.) Then, rotate **SQUELCH** in a clockwise direction to the point where the background noise just stops. Now, when a signal is present, you will hear it, but will not be disturbed by noise on the channel in between signals.
   When properly set, **SQUELCH** will keep the receiver "dead" until a signal comes in on that channel. Do not set **SQUELCH** too high, or weak signals will not be able to "open" the Squelch circuit. To receive weak signals, it is best to leave **SQUELCH** set to the minimum position (maximum counterclockwise).
5. Adjust **VOLUME** for a suitable listening level.

TO TRANSMIT

1. Select the desired channel of operation.
2. Press the push-to-talk button on the Microphone and hold it at a slight angle, 2–3" (5–7.5cm) from your mouth and speak in a normal voice. The **Modulation Indicator** light will flash each time you speak.
3. To Receive, release the push-to-talk button.

ANTENNA SYSTEM

The antenna system includes the transmission line, and it is very important that you use the correct type of transmission line. The transmission line should be of the coaxial type and should have an impedance equal to the antenna impedance.

Since your Transceiver is designed to operate most efficiently into a 50 ohm load, it is best to use a type of coaxial cable with an impedance of 50 ohms. We suggest type RG-58/U for short lengths and RG-8/U for long lengths.

Generally speaking, you should keep the length of the transmission line to a minimum. Remember that transmission line losses increase with length. Use foam-insulation coax for best results.

If the transmission line must be long, keep it to exact multiples of a halfwave length, that is, multiples of 14 ½feet (4.4m). This will assure a proper impedance match and thus maximum transfer of power from the transmitter to the radiating antenna.

The above discussion is as important for reception as it is for transmission. If a mismatch exists between the antenna and the receiver, the excellent sensitivity and signal-to-noise ratio of the receiver circuitry will be defeated.

FIXED STATION ANTENNAS

The most popular fixed station antenna is a complex colinear or ground plane.

Beam antennas provide maximum gain and maximum directivity. The directivity can be a disadvantage unless a rotor is used. Since a beam antenna is directional, it greatly reduces noise and interference from all other directions. This can be a decided advantage on the CB bands where man-made noise and interference from other CB signals is a problem.

Your Radio Shack store carries a complete line of base station CB antennas and accessories. For maximum efficiency, we strongly recommend using an SWR meter to aid in the proper matching of your antenna and Transceiver.

The antenna system should be adequately grounded.

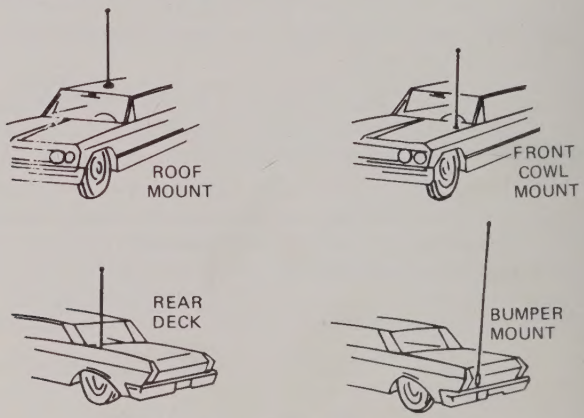
Always use a lightning arrester for your antenna system.

MOBILE STATION ANTENNAS

Mobile CB antennas are one of two types: a full-length or a loaded whip. Your local Radio Shack store has a complete line of both types. Drop in, they will be glad to help you select the best antenna for your needs.

A vertically polarized whip antenna is best suited for mobile service. It is non-directional and can be of the loaded type or a full quarter wave (quarter-wave being more efficient).

There are many possible antenna mounting locations on a car. Four of the most popular locations are shown below.



MOBILE ANTENNA MOUNTING

ROOF MOUNT—This position allows the antenna to radiate equally in all directions. Since the normal ¼ wavelength whip antenna is too long (102" [2.6m]) for roof mounting on a vehicle, the antenna is shortened and a loading coil is utilized to provide the proper electrical length. Our Fiberglass Roof-Mount, Radio Shack Catalog Number 21-925, is a durable antenna you can appreciate.

FRONT COWL MOUNT—The radiation pattern is slightly greater in the direction of the rear fender opposite to the side on which the antenna is mounted. However, this position offers a number of advantages. The CB antenna can be easily mounted. It can double as both the CB and the standard auto radio antenna by employing a two-way coupler. Ask about our 21-930 Cowl Mount antenna which can be used for CB, AM and FM operation.

REAR DECK—The radiation pattern is greater in the direction of the front fender opposite to the side which the antenna is mounted. In this position you can use a full quarter-wave antenna or a shorter, loaded whip.

BUMPER MOUNT—The antenna radiates in a pattern directly in front of and to the rear of the vehicle, with maximum radiation directly away from the vehicle, in a horizontal plane. Despite its fairly irregular pattern, a bumper mounted full-length whip antenna will normally give the best results. Antenna removal is simple in this position and will leave no holes in the car body. We suggest you try our Bumper Mount Fiberglass Whip, 21-927 for ideal operation.

A few general rules should be followed for proper installation of any mobile antenna:

1. Keep it as far as possible from the main bulk of the vehicle.
2. Keep as much of it as possible above the highest point of the vehicle or boat.
3. During operation, it must be vertical. Thus, it should be mechanically rigid so it will maintain a vertical position when the vehicle or boat is in motion.
4. Mount it as far as possible from sources of noise (ignition system, gauges, etc.) and convenient for transmission line routing away from these noise sources.

An antenna mounted in a boat requires a ground. This can be either the metal hull or a ground made of tin-foil or copper sheeting. This ground should cover an area of 12 square feet ($1m^2$) or more. Be sure the transceiver has an adequate ground as well.

For further information, pick up a copy of Realistic Guide to Citizens Band Radio (62-2044) and/or Introduction to Antennas (62-2051).

NOISE

Your vehicle or boat can be the cause of much noise interference. Since the receiver section of your transceiver is very sensitive, it will pick up even the smallest noise signals and amplify them. Any noise that you hear in the transceiver is almost totally from external sources. The receiver itself is exceptionally quiet. Steady high noise levels can not be totally eliminated by the internal Automatic Noise Limiter circuit. **Noise problems can not be solved internally (in the transceiver); they must be solved at the source of the noise.**

This interfering noise can be generated anywhere in the electrical system of the vehicle or boat. The first step in reducing or eliminating this noise is to locate the source of the noise.

If you wonder if the noise is from your ignition system, the transceiver or an external source, try this simple test. Turn your ignition switch off and set to ACC (accessories). This turns off the ignition, but supplies power to the transceiver. Most of the noise will disappear—indicating the source of noise is your ignition system.

IGNITION SYSTEM

The ignition system is the most common source of noise. This noise can be identified by the fact that it varies with the speed of the engine. It consists of a series of popping sounds occurring at a regular rate that will vary with the speed of the engine and stop when the ignition is turned off.

There are a number of things that can be done to reduce this type of noise:

1. Use only the "radio suppression type" high voltage ignition wire. Most new cars come already equipped with this type of wire.
2. Inspect the high voltage ignition wire and all connections made with this wire. Old ignition wire may develop leakage, resulting in hash.
3. If noise still persists, replace the spark plugs with spark plugs that have suppressor resistors built-in. Be sure to use the correct type for your vehicle.

Other sources of noise are: generator/alternator, regulator, gauges and static discharge. Most of these types of noise can be effectively reduced or eliminated by using bypass capacitors at the various output voltage points. We suggest you check your Radio Shack store for a wide selection of noise reduction accessories.

10-CODE

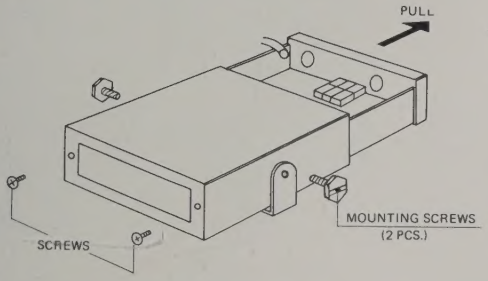
Citizens Band operators have largely adopted the 10-code for standard questions and answers. Its use permits faster communication and better understanding in noisy areas. The following table lists some of the more common codes and their meaning.

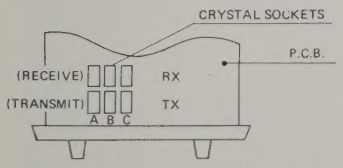
Code	Meaning	Code	Meaning
10-1	Receiving poorly	10-10	Standing by
10-2	Receiving well	10-13	Advise road/weather conditions
10-3	Stop Transmitting	10-20	What is your location?
10-4	OK	10-33	Emergency traffic
10-7	Out of Service	10-36	Correct time
10-8	In Service	10-41	Switch to Channel....
10-9	Repeat	10-99	Cannot copy you

CRYSTAL INSTALLATION

You can operate on any 3 of the 23 CB channels by installing suitable crystals in each internal crystal socket. The actual channel on which the transceiver operates is determined by the frequency of the crystals in the unit. Crystal sockets are provided inside the case, on the circuit board. Remove the two Universal Mounting Bracket hex screws and the two screws at the back of the cabinet and pull out the chassis. Plug crystals into the sockets on the circuit board (see below). Plug Transmit (TX) crystals into TX sockets and Receive (RX) crystals into RX sockets. Do NOT interchange or mix RX and TX crystals. Always have a matched set in each pair of crystal sockets (e.g., channel 2 TX crystal with channel 2 RX crystal). Order crystals from Radio Shack, stating channel number and catalog number.

Radio Shack is not responsible for poor operation when crystals of another manufacturer are used.

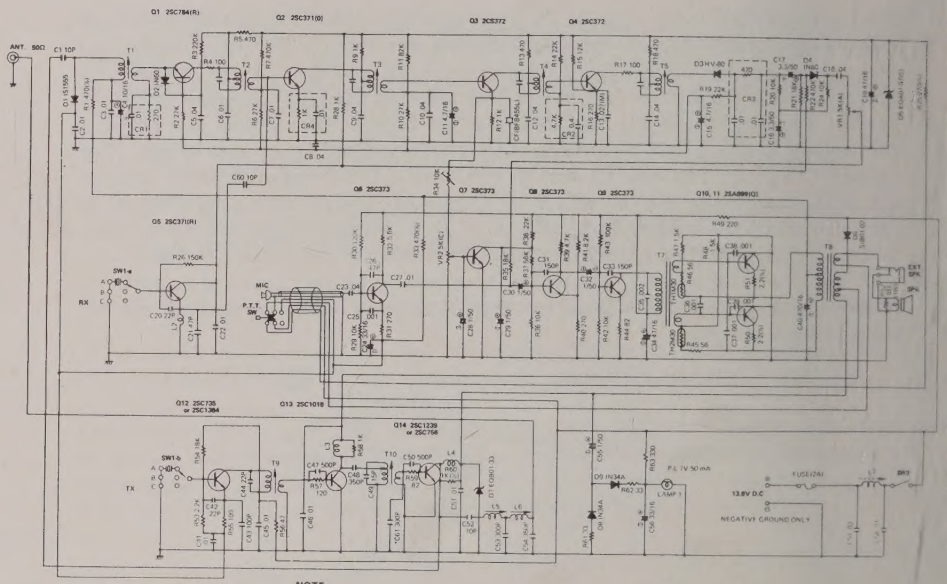




NOTE: WHILE CHASSIS IS OPEN BE CAREFUL NOT TO DISTURB ANY COIL ASSEMBLIES, AS THEY MAY AFFECT CRITICAL ALIGNMENT WITHIN THE UNIT.

Your TRC-9A has been completely aligned and adjusted at the factory. Don't attempt any adjustments. Repairs and adjustments to this transceiver may be made legally only by a person in possession of a valid First or Second Class FCC Radiotelephone Operators License (or equivalent in Canada), or by a person under the direct supervision of a holder of such a license. If alignment or adjustment is required take your unit to the local Radio Shack store.

SCHEMATIC DIAGRAM



NOTE:

1. SW1a-b CHANNEL SW.
2. SW2 POWER SW W/VR1
3. RESISTANCE VALUES IN OHMS, K = 1000
4. CAPACITANCE VALUES IN MF, P = MMF

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